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REVIEW OF THE CURRENT MARKET SITUATION AND OUTLOOK

Market situation and outlook for bauxite, alumina and aluminium

Report by the UNCTAD secretariat

CONTENTS

		Paragraphs
	Introduction and summary	1 - 8
I.	Demand	9 - 11
II.	Supply	12 - 23
	A. Production of bauxite, alumina and aluminium 1992-1993	12 - 15
	B. Specific factors affecting supply	16 - 23
	1. Changes in production capacity	16 - 19
	2. Changes in operating rates	20 - 22
	3. Developments in costs of production	23
III.	Trade	24 - 25
IV.	Supply/demand balance and prices	26 - 30
V.	Outlook	31 - 38
	A. Outlook for 1994-1995	31 - 33
	B. Long term outlook	34 - 38

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ANNEX

Table

A.1: Changes in bauxite mine production capacity 1992-1993

A.2: Changes in alumina refinery capacity 1992-1993

A.3: Changes in aluminium smelter capacity 1992-1993

A.4: Expected changes in bauxite mine production capacity 1994-1995

A.5: Expected changes in alumina refinery capacity 1994-1995

A.6: Expected changes in aluminium smelter capacity 1994-1995

INTRODUCTION AND SUMMARY

1. This report provides an overview of changes in the bauxite/alumina/aluminium market and industry during 1992 and 1993 and some indications concerning the outlook for 1994 and 1995. It should be noted that world production and consumption, unless otherwise stated, refer to the world excluding countries of Eastern Europe and socialist countries of Asia, the reason for this being the difference in availability of data between this group of countries and the rest of the world.

2. Following a drop in 1991, consumption of aluminium recovered in 1992, but declined again in 1993. The large differences in economic growth rates between the major aluminium consuming regions during the period resulted in correspondingly large variations in the development of aluminium consumption, with consumption growing rapidly in the United States, Germany and the United Kingdom but declining in Japan and in several European countries. Consumption of primary aluminium in Eastern European countries is estimated to have continued falling in 1992 and 1993, while in China consumption increased at very high rates.

3. World production of bauxite declined by 2.7 per cent in 1992, while alumina production declined by 0.5 per cent and production of primary aluminium by 0.1 per cent. In 1993, bauxite production increased during the first part of the year, and for the whole of 1993 it is likely to have been significantly higher than in 1992. Aluminium production is estimated to have increased by about 1.4 per cent, and production of alumina is likely to have increased at roughly the same rate.

4. In 1992, the cutbacks in aluminium production combined with relatively strong growth in world consumption would have led to a reduction in inventories by about 0.6 million tons if it had not been for imports from the Republics of the former USSR. As it happened, inventories instead increased by slightly more than 0.5 million tons. Inventories continued to grow in 1993, with a total increase of 1.16 tons, all of which can be attributed to continued large net imports from the Republics of the former USSR. The price of aluminium continued to be depressed by the large inventory levels and reached a low of US$ 1024 per ton in November 1993. Thanks to increased demand from the Republics of the former USSR, alumina prices held up somewhat better than aluminium prices until the last several months of 1993, when they turned down, while bauxite prices are reported to have fallen.

5. In August 1993, the European Community decided to impose limits on aluminium imports from the Republics of the former USSR. The measure did not, however, prohibit aluminium from being placed in London Metal Exchange (LME) warehouses. Only when the metal left the warehouse would it be counted against the limits. The decision had no discernible impact on the volume of exports from the Republics of the former USSR. The continued growth in inventories and the absence of indications that exports from the Republics of the former USSR are diminishing led to calls for concerted efforts or interventions in order to redress the imbalance. Intergovernmental discussions were initiated with the aim of identifying and agreeing on measures that would reduce the excess supply and that would be acceptable to all the parties concerned. Discussions involving Australia, Canada, Norway, the Russian Federation, the United States and the European Community in January 1994 resulted in a memorandum of understanding according to which the rate of world primary aluminium output in 1994 and 1995 will be reduced by an amount corresponding to 2 million tons per year compared to the rate of output in November 1992. Of the total, reductions corresponding to 0.5 million tons will be undertaken by producers in the Russian Federation. The aluminium industry in the Russian Federation will receive technical and financial assistance for modernization and restructuring.

6. Assuming that the memorandum of understanding is implemented in full and that the rate of primary aluminium output in market economy countries is reduced by 1.5 million tons compared to the rate of production in November 1992, production in 1994 will decline by about 1,220,000 tons as compared to 1993. If consumption is assumed to increase by 4 per cent, which appears reasonable against the background of the decline in 1993 and expectations of a slow upturn in the business cycle, this increase would correspond to slightly more than 600,000 tons. The production/consumption balance would thus change by more than

1.8 million tons. Assuming further that net exports from the Republics of the former USSR decline by 0.5 million tons, implying that consumption in these countries remains unchanged compared to 1993 and that Chinese imports increase by a further 100,000 tons, this would allow inventory reductions of 1.2 million tons. The trend of increasing inventories would thus be reversed, and although the supply overhang would still be large, since reported inventories of unwrought aluminium (IPAI and LME) would amount to about 3.2 million tons, or more than two and a half months' consumption of primary aluminium, it is likely that prices would strengthen gradually. Assuming that consumption increases by 0.5 million tons in 1995 and that production and Chinese imports are unchanged, inventories would be reduced to about 1.5 million tons by the end of that year - a level that could be considered normal. It appears likely that a gradual return to close to full capacity utilization in 1996 would be consistent with market equilibrium.

7. Total production capacity for metallurgical alumina is expected to increase by 1.6 million tons over the next two years. The cutbacks in primary aluminium production will lead to a significant weakening of the alumina market. Bauxite mine capacity is likely to increase by about 3.2 million tons in 1994/95, which means that the situation in the bauxite market, with an excess of supply over demand, is likely to remain unchanged.

8. In the longer term, the fact that aluminium is replacing other materials rather than being replaced by them implies that aluminium consumption will probably continue to grow at a rate higher than that of industrial production or GDP, assuming, of course, that the price of aluminium relative to other materials does not increase significantly. Smelter operating costs will probably increase in the future since the limits of what can be achieved through rationalization have been reached in many cases, and since prices of alumina and electric power are likely to rise. The rising costs, together with the experience of the present recession, may act as a disincentive to investment. There does not appear to be a large risk, however, that investment would be insufficient to meet demand later during this decade. Nevertheless, it is probably important not to retire too much capacity permanently in the present recession and to undertake the investments that will allow smelters that at present are inefficient or polluting to improve their operations. The risk of a shortage of alumina in the second half of this decade must be considered to be higher than the risk of an aluminium shortage.

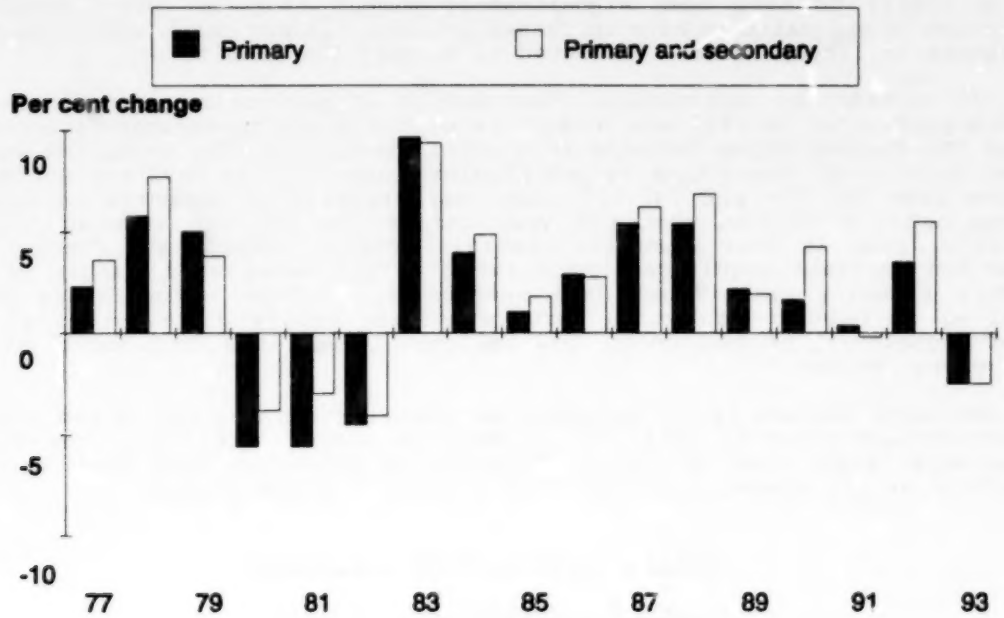
I. DEMAND[1]

9. Following a drop in 1991, world consumption (excluding countries of Eastern Europe and socialist countries of Asia) of aluminium recovered in 1992, with primary metal consumption increasing by 3.5 per cent and total consumption rising by 5.5 per cent. At the time of writing, data on world aluminium consumption in 1993 are not yet available. It is also difficult to make a reasonably accurate estimate, since, while production and inventory developments are known or can be estimated with a good degree of accuracy, net exports from countries of Eastern Europe and socialist countries of Asia to the rest of the world are unknown[2]. Assuming, however, that these net exports amounted to 1.2 million tons in 1993 (see section IV below), world primary aluminium consumption decreased by 2.5 per cent in 1993. Total consumption is likely to have decreased at about the same rate, since production in the automobile industry, which is a major user of recycled metal, has decreased in most countries concerned. Figure 1 shows the development of world consumption since 1977.

10. The large differences in economic growth rates between the major aluminium consuming regions during the period resulted in correspondingly large variations in the development of aluminium consumption. In North America, consumption of primary aluminium increased by 10 per cent in 1992, while total consumption, including secondary metal, increased by 13.5 per cent. The dramatic increase should be seen against the background of a very weak development of consumption, in particular of primary aluminium, since 1988. Demand is estimated to have continued increasing in 1993, reflecting the rise in the economic growth rate. In Europe, primary consumption rose by 3.1 per cent in 1992, reflecting strong demand in Germany as a result mainly of infrastructural investments following reunification, and in the United Kingdom, while elsewhere consumption declined or stagnated due to the weak growth rates. Total consumption increased at about

the same rate, reflecting that sectors using recycled aluminium are relatively less important in Europe than in North America. Consumption in 1993 is likely to have declined since the expected economic upturn did not materialize. In Japan, primary consumption declined by 5.1 per cent in 1992. Total consumption, which was supported to some extent by a continued strong increase in demand for beverage cans and constant consumption in the transportation industry, both of which use large amounts of secondary metal, fell by 2.9 per cent. Consumption is likely to have fallen in 1993 as well, although possibly at lower rates than in 1992[3].

Figure 1 Annual change in world aluminium consumption 1977-1993



Source: Metallgesellschaft: Metal Statistics; UNCTAD secretariat.

11. Accurate data on consumption in countries of Eastern Europe and socialist countries of Asia are not readily available. However, consumption of primary aluminium in Eastern European countries, which is estimated to have fallen by 18.8 per cent in 1991, reflecting the decline in industrial activity brought on by the economic transformation, is believed to have fallen by a further 5.9 per cent in 1992. It should be noted that these estimates are considered to be very uncertain, and that the decline in consumption may have been larger, in particular in the republics of the former USSR. Total consumption, including secondary metal, is likely to have declined more, since secondary metal production is reported to have fallen dramatically due to a shortage of scrap[4]. Consumption in China was spurred on by the extremely high rate of growth in industrial production and increased by 33.7 per cent in 1992, more than offsetting the decline in Eastern Europe, following an increase of 11.4 per cent in 1991. Accordingly, total world consumption of primary aluminium, including consumption in these countries, is estimated to have increased by 3.7 per cent in 1992, while consumption of primary and secondary metal is estimated to have risen by 5.3 per cent. In 1993, consumption in Eastern Europe is likely to have continued its decline while consumption in China has continued to grow rapidly.

II. SUPPLY

A. Production of bauxite, alumina and aluminium 1992 - 1993[5]

12. World production of bauxite (excluding countries of Eastern Europe and socialist countries of Asia) declined by 2.7 per cent in 1992, while alumina production declined by 0.5 per cent and production of primary aluminium by 0.1 per cent. The differences in the rates of decline between the production stages are likely to reflect underlying errors in estimates used for the statistics. In the case of bauxite, reductions in output rates, undertaken in order to allow stocks to be drawn down, may also have played a role.

13. In 1993, bauxite production increased during the first part of the year, and is likely to have been significantly higher than in 1992[6]. Aluminium production is estimated to have increased by about 1.4 per cent[7], and production of alumina is likely to have increased at roughly the same rate.

14. As regards the geographical distribution of production, the decline in bauxite production in 1992 was relatively evenly distributed among producers, as was the corresponding decrease in alumina production. The exception was in former Yugoslavia, where bauxite and alumina production in 1992 are estimated to have been 800,000 and 340,000 tons respectively, as compared to over 3 million and 1.2 million tons per year before the war. As regards primary aluminium, only in four countries (Bahrain, Brazil, Canada and France) did production increase significantly in 1992, in all cases as a result of new capacity becoming operational (see section B.1). Cuts in operating rates resulting in reduced production were relatively evenly distributed. In the former Yugoslavia, production in 1992 fell to 170,000 tons from about 350,000 tons before the war.

15. No major changes in the geographical distribution of bauxite and alumina production took place in 1993. At the smelting stage, cutbacks in the United States were larger than in the other producing countries (see section B.2). Production at all stages continued to decline in Eastern Europe.

B. Specific factors affecting supply

1. Changes in production capacity

16. World bauxite production capacity (excluding countries in Eastern Europe and socialist countries of Asia) increased by about 1.5 million tons in 1992-1993. The changes included the closure of the Moengo mine in Suriname in 1992, the opening of the Accaribo mine in the same country, the expansion of the mine at Los Pijiguaos in Venezuela and the expansion of the Nain mine in Jamaica (see table A.1 in the annex). No mines were opened or closed in 1993. It should be noted that capacity figures for bauxite mines have to be interpreted with caution, since in many cases, given the nature of most bauxite deposits, capacity changes can be implemented relatively easily. It is therefore difficult to distinguish between temporary changes in operating rates and more permanent changes in capacity. Furthermore, capacity is often expanded in small increments which are usually not reported in trade journals.

17. Alumina production capacity increased by almost 2 million tons over the period, with most of the increase taking place in 1993 (see table A.2 in the annex). The entire increase was accounted for by expansions of existing refineries. Australia, Venezuela, Jamaica and Brazil accounted for most of the increase in capacity.

18. Primary aluminium production capacity increased by about 850,000 tons over the period, with almost the entire expansion taking place in 1992 (see table A.3 in the annex). The net increase was composed of additions to capacity corresponding to 1,065,000 tons per year, of which 645,000 tons at new smelters, and partial or complete shutdowns corresponding to about 200,000 tons per year. Canada accounted for more than half of the new capacity, with two new smelters, Alumax's Deschambault smelter and the Alouette smelter, owned by an international consortium with participation by the Government of Quebec, entering production. The only other new smelter to come on stream during the period was the Dunkerque smelter in France. Existing smelters were expanded in

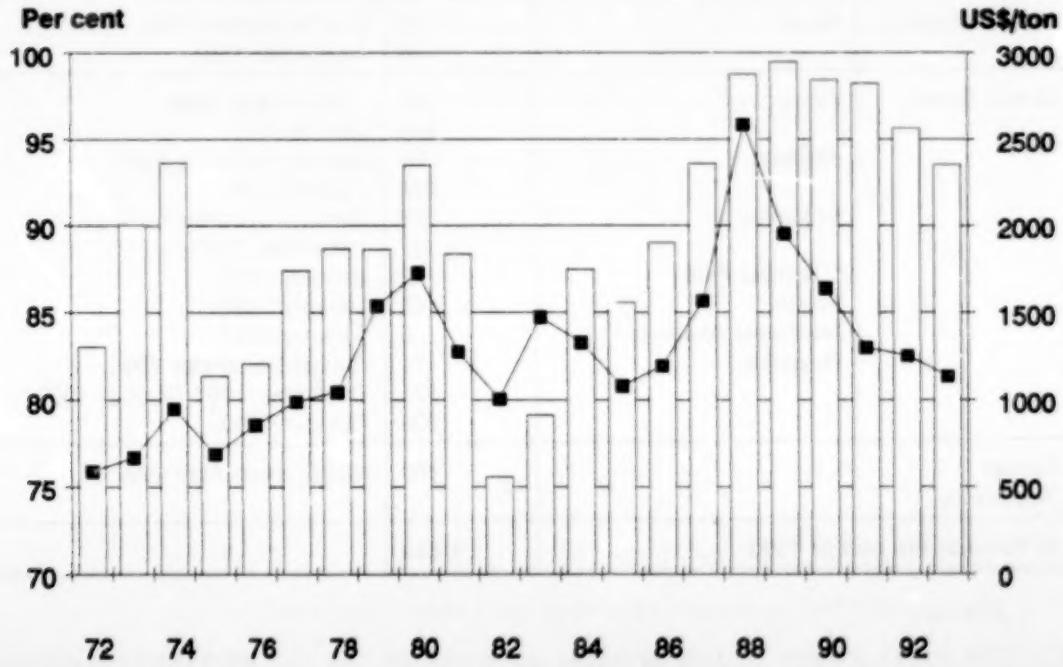
Australia, Bahrain and the Islamic Republic of Iran. Smelters were closed down in Austria, India and Italy.

19. Changes in production capacity in the countries of Eastern Europe and in socialist countries of Asia are not included in the above figures. The economic transformation of the former group of countries has had a severe impact on the mining and metallurgical industry, with several operations being closed down due to their lack of competitiveness and because they do not conform with new environmental regulations. In Hungary, three of the four smelters were closed down at the end of 1992, and bauxite and alumina output has also been reduced as a consequence. At the large Slatina smelter in Romania, 60 per cent of capacity has been closed down due to a shortage of power. Exports have been cancelled because of lack of international competitiveness. Finally, it is difficult to establish to what extent production capacity in the bauxite/alumina/aluminium industry in the former Yugoslavia has been destroyed in the war. It is known that for instance the Mostar refinery/smelter complex in Bosnia-Herzegovina has been destroyed, and that it is unlikely to be rebuilt.

2. Changes in operating rates

20. As observed in the market review prepared in 1993 for the Second Ad hoc Review Meeting on Bauxite[8], operating rates of aluminium smelters have remained high in the present recession despite very low prices. Figure 2 shows aluminium prices and capacity utilization in aluminium smelters during the period 1972 to 1993[9]. While production has been reduced during the current recession, the reductions have clearly not been sufficient to reestablish the balance between supply and demand, in particular since they were undertaken relatively late. Table 1 shows cutbacks in the operating rates of existing aluminium smelters during the period 1991 to 1993.

Figure 2 Capacity utilization in aluminium smelters and price 1972-1993



Sources: International Primary Aluminium Institute (capacity and production); UNCTAD: Commodity Price Bulletin (prices)

Table 1: Cutbacks in operating rates of primary aluminium smelters in 1991-1993 (1 000 metric tons per year)

Country	Company	Quantity	Effective from-to
Argentina	Aluar	15	October 1991-
Brazil	Alcan	27	November 1992-
	Valesul	23	September 1993-January 1994
Canada	Alcan	68	November 1991-October 1992
France	Pechiney	44	December 1992-
Germany	Vereinigte	32	October 1991-October 1992
	Aluminiumwerke (VAW)	105	October 1992-
	Alusuisse	90	March 1992-
	Hoogovens	9	End 1991-
Mexico	Grupo Carso (ex-Alcoa)	55	Autumn 1991-July 1992
		80	July 1992-
Netherlands	Pechiney	22	October 1991-December 1992
		35	December 1992-
	Hoogovens	9	End 1991-
New Zealand	Comalco	86	June-July 1992 (power shortage)
Norway	Hydro	45	November 1991-
Sweden	Gränges	20	December 1991-
United Kingdom	Alcan	10	July-November 1991
		76	November 1991-
United States	Alcoa	42	January-July 1993
		310	July 1993-
	Alumax	64	January-February 1993
		104	February 1993-
	Columbia	27	January-December 1993
		37	December 1993-
	Columbia Falls	42	January 1993-
	Kaiser	68	January 1993-
	Northwest Aluminium	5	January 1993-
	Reynolds	71	August-December 1991
		121	December 1991-October 1993
		209	October 1993-
Former Yugoslavia		180	Mainly since April 1992
In force at the end of 1993		**1 533**	

Source: UNCTAD secretariat based on trade journals.

21. The total amount of the cutbacks in force at the end of 1993 corresponded to more than 1.5 million tons per year, or about 10 per cent of capacity. Actual cutbacks may be larger, since there is no certainty that all cutbacks are reported. Smelters in the United States, in particular those operated by Alcoa and Reynolds, accounted for most of the cutbacks at almost 800,000 tons. Some of these cutbacks were however forced on smelters due to the reductions in power deliveries undertaken by the Bonneville Power Administration at the beginning of 1993 as a result of lower than normal rainfall in the northwestern part of

the country. In January 1994, Alcan announced that it would reduce output by a further 156,000 tons per year, with reductions taking place mainly in Canada and the United States[10]. It should be noted that the cutbacks are not fully reflected in figure 2, which shows capacity utilization as annual production in relation to mid-year capacity.

22. The lateness and relatively small amount of cutbacks in operating rates during the present recession is in contrast with the experience during previous periods of low prices. As discussed in the market review prepared in 1993, there are several explanations for this, the most important of which are probably the reduced degree of concentration in the industry and the fact that smelters have succeeded in insulating themselves from some of the effects of price falls by linking input prices to the price of aluminium. Another important factor may be that the costs of exit have increased for many smelters. In many cases, power tariffs have an important fixed component or "bottom charge" which has to be paid whether the smelter is producing or not. Long-term contracts for other inputs may also have to be honoured for a long time after closure. Finally, reductions in personnel may be very expensive to undertake or may not even be permitted. For all these reasons, smelters may choose to continue producing although prices do not cover even direct cash production costs.

3. Developments in costs of production

23. Operating costs of aluminium smelters are estimated to have continued decreasing in 1992 and 1993. The main reasons for the fall in costs are declining alumina prices (in long-term contracts the alumina price is often tied to the price of aluminium) and, more importantly, the rise in the exchange rate of the US dollar against most other currencies. Average operating costs are estimated to be 50.4 US cents per pound (US$ 1110 per ton). As a result of the changes in exchange rates, smelters in the United States now have higher average operating costs than smelters in Europe[11]. Expected increases in power tariffs may widen the gap further[12]. At the prices prevailing in early 1994, a high proportion of smelters, probably more than half of those in operation, were unable to cover operating costs. Production costs for alumina and bauxite have been more stable than for primary aluminium, although operating costs in many alumina refineries have been reduced significantly over the past several years as a result of continuous rationalization.

III. TRADE

24. The most important development in international trade in aluminium in recent years has been the massive increase in exports from the Republics of the former USSR, in particular the Russian Federation, to the international market. Official exports from the Russian Federation in 1992 were 959,300 tons, up from 763,400 tons in 1991[13]. To this should be added about 400,000 tons of exports from other republics, mainly Tajikistan, in 1992. Unofficial exports may have added further significant quantities. There is no sign of exports having declined, and estimates of total exports from the Republics of the former USSR in 1993 vary from 1.2[14] to 1.9 million tons[15]. It is noteworthy in this context that a large portion of Russian exports, probably about two thirds, represents aluminium that is toll smelted in the Russian Federation.

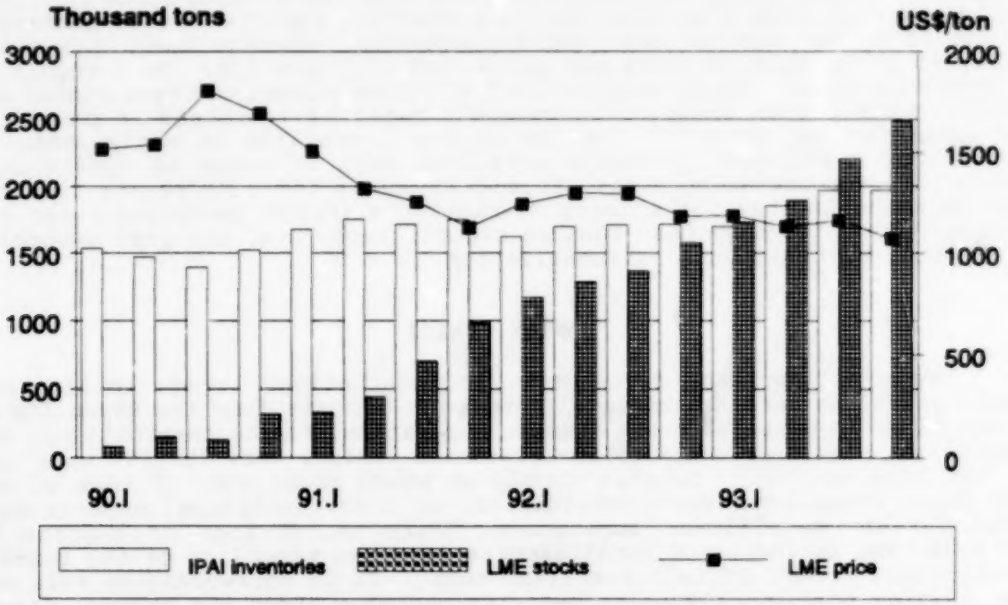
25. In August 1993, the European Community decided to impose limits on aluminium imports from the Republics of the former USSR. From August until the end of November, imports were limited to 60,000 tons, corresponding to 15,000 tons per month[16]. Subsequently, the same limits were extended from December 1993 to the end of February 1994. The measure did not, however, prohibit aluminium from being placed in London Metal Exchange (LME) warehouses. Only when the metal left the warehouse would it be counted against the limits. The decision had no discernible impact on the volume of exports from the Republics of the former USSR. Neither did it have any immediate effect on the discounts on metal from these countries that have been applied by the industry and which range from US$ 20 to 100 per ton[17]. Only at the end of the year did the discounts diminish as exports from the Republics of the former USSR were increasingly rerouted to the United States and Japan[18]. The decision was criticized by some representatives of the secondary aluminium industry in the European Community on the grounds that it deprived that industry of a source of cheap raw material and worsened

its competitive position relative to producers in other countries that did not face the same restrictions[19]. It was also criticized by representatives of primary aluminium producers outside the European Community, who saw it as ineffective and failing to address the reasons for the imbalance in the market[20].

IV. SUPPLY/DEMAND BALANCE AND PRICES

26. In 1992, the cutbacks in aluminium production combined with relatively strong growth in world consumption (excluding countries of Eastern Europe and socialist countries of Asia) would have led to a reduction in inventories by about 0.6 million tons if it had not been for imports from the Republics of the former USSR. As it happened, inventories instead increased by more than 0.5 million tons[21]. Inventories continued to grow in 1993, with a total increase of 1.16 million tons. Assuming that Chinese imports were about 400,000 tons (up from 230,000 tons in 1992), which seems likely in view of the continued rapid growth of industrial production, and assuming further that net exports from Eastern Europe, including the Republics of the former USSR, were 1.6 million tons, world consumption decreased by about 380,000 tons or 2.5 per cent. Table 2 shows how the supply/demand balance evolved during 1992/93 and figure 3 shows the development of inventories and the aluminium price during the period 1990 to 1993.

Figure 3 Unwrought aluminium stocks and prices



Sources: International Primary Aluminium Institute; UNCTAD secretariat.

27. The price continued to be depressed by the large inventory levels in 1992 and 1993 and reached a low of US$ 1024 per ton in November 1993. While this level does not constitute the "collapse" of the price that was seen to be a possibility in the market review prepared in 1993[22], it is nevertheless a level at which only very few aluminium producers are able to cover their costs and which does not provide any incentive for investment. It might be asked why the price stayed at roughly the same level from the second half of 1991 until the beginning of 1994, in spite of growing inventories and a seeming inability on the part of producers to make the necessary supply adjustments. The answer is likely to be that speculators found aluminium at around US$ 1100 per ton to be a reasonably attractive investment at the prevailing low rates of interest and that they were therefore prepared to continue financing the inventories in the

hope that the price trend would turn upward again in the relatively near future, possibly as a result of increased production cutbacks expected to result, inter alia, from intergovernmental discussions. In response to the agreement reached in those discussions (see paragraph 28) the price increased, but not by more than about 10 per cent, which would appear to indicate that the market had to some extent already discounted the news.

Table 2
Supply/demand balance (market economy countries) for primary aluminium 1992-93 (thousand metric tons)

	1992[a]	1993[b]
Production	14,915	15,100
Consumption	15,523	15,140
Surplus (+) or deficit (-)	-608	-40
Net imports[c]	+1,134	+1,200
Change in inventories	+526	+1,160

[a] Production from World Bureau of Metal Statistics, consumption from Metallgesellschaft: Metal Statistics, change in inventories from the International Primary Aluminium Institute (IPAI and LME stocks), net imports estimated by the UNCTAD secretariat.
[b] Estimated by the UNCTAD secretariat.
[c] From Eastern Europe and socialist countries of Asia

28. The continued growth in inventories and the absence of indications that exports from the Republics of the former USSR are diminishing have led to calls for concerted efforts or interventions in order to redress the imbalance. Intergovernmental discussions were initiated with the aim of identifying and agreeing on measures that would reduce the excess supply and that would be acceptable to all the parties concerned. Discussions involving Australia, Canada, Norway, the Russian Federation, the United States and the European Community were held in Moscow in October 1993, Washington D.C. in December 1993, and Brussels in January 1994. The discussions resulted in a memorandum of understanding according to which the rate of world primary aluminium output in 1994 and 1995 will be reduced by an amount corresponding to 2 million tons per year compared to the rate of output in November 1992. Of the total, reductions corresponding to 0.5 million tons would be undertaken by producers in the Russian Federation. The aluminium industry in the Russian Federation will receive technical and financial assistance for modernization and restructuring.

29. Alumina prices have held up somewhat better than aluminium prices. Prices on the spot market for alumina increased in mid-1992 from a range of US$ 130 to $ 140 per ton to $ 165 to $ 175 and remained at that level until mid-1993 in spite of the weak development of aluminium production. The reason for the rise in prices was increased demand from the Republics of the former USSR, where some refineries have had difficulties maintaining production levels. The war in the Republics of the former Yugoslavia, which was an important supplier of alumina to the USSR, has affected deliveries from these countries and increased the need for larger imports from other suppliers. It has been reported that a large portion of the alumina exports to the Russian Federation is accounted for by tolling arrangements where alumina is converted to aluminium[23]. In the last several months of 1993, however, alumina prices fell by US$ 30 to 35 per ton, as cutbacks in primary aluminium output, particularly in the United States, took effect[24]. In response to the reduced demand, the largest producer, Alcoa of Australia, reduced its production in the final quarter of 1993 by 6 per cent[25].

30. Prices for bauxite have been more affected by the weak aluminium market than alumina prices, mainly because there has been no positive development corresponding to the increased ex-USSR purchases in the case of bauxite. Bauxite prices in long-term contracts are normally linked to the aluminium price and have been exposed to the impact of its fall, although the effect has been softened by the fact that normally only 50 per cent of the price is determined in this manner. Nevertheless, bauxite from Trombetas in Brazil was reported to

have been sold at prices of about US$ 21 per ton in mid-1993, down from $ 28 earlier, while the price of material from the Boke mine in Guinea was understood to have fallen from $ 31 to $ 32 to around $ 25 per ton[26]. It is generally estimated that significant excess capacity exists in the bauxite market[27]. To some extent, the surplus will be augmented by planned releases of about 4.2 million tons of bauxite from the United States National Defense Stockpile over five fiscal years, starting in fiscal 1993[28].

V. OUTLOOK

A. Outlook for 1994-1995

31. Assuming that the memorandum of understanding referred to in the previous section is implemented in full and that the rate of primary aluminium output in market economy countries is reduced by 1.5 million tons compared to the rate of production in November 1992, production in 1994 will decline by about 1,220,000 tons as compared to 1993. If consumption is assumed to increase by 4 per cent, which appears reasonable against the background of the decline in 1993 and expectations of a slow upturn in the business cycle, this increase would correspond to slightly more than 600,000 tons. The production/consumption balance would thus change by more than 1.8 million tons. Assuming further that net exports from the Republics of the former USSR decline by 0.5 million tons, implying that consumption in these countries remains unchanged compared to 1993, and that Chinese imports increase by a further 100,000 tons, this would allow inventory reductions of 1.25 million tons. The trend of increasing inventories would thus be reversed, and although the supply overhang would still be large, since reported inventories of unwrought aluminium (IPAI and LME) would amount to about 3.2 million tons, or more than two and a half months' consumption of primary aluminium, it is likely that prices would strengthen gradually. Assuming that consumption increases by 0.5 million tons in 1995 and that production and Chinese imports are unchanged, inventories would be reduced to about 1.5 million tons by the end of that year - a level that could be considered normal. It appears likely that a gradual return to close to full capacity utilization in 1996 would be consistent with market equilibrium, taking into account both the only significant planned addition to capacity (the Alusaf Hillside smelter in South Africa) and assuming continued growth in consumption at an annual rate of 2-3 per cent.

32. The only major addition to alumina production capacity in 1994/95 will be the Alunorte refinery in Brazil, which is likely to enter into operation in 1995. Total production capacity for metallurgical alumina is expected to increase by 1.6 million tons over the next two years. The cutbacks in primary aluminium production will lead to a significant weakening of the alumina market. The weakening is however likely to be temporary, and a need for new investment would materialize relatively quickly (see section B below).

33. Bauxite mine capacity is likely to increase by about 3.2 milion tons in 1994/95 as the result mainly of expansions taking place at the Trombetas mine in Brazil and the Panchpatmali mine in India. Accordingly, the situation in the bauxite market, with an excess of supply over demand, is likely to remain unchanged.

B. Long term outlook

34. Over the past several years, two sectors have shown a more dynamic development of demand than others: packaging, in particular beverage cans, and the automobile industry. In the case of beverage cans, world consumption is expected to grow at an annual rate of 7.4 per cent from 1993 to 2000. While aluminium has captured almost the entire market for metal beverage containers in the United States, where shipments of can sheet are still forecast to increase at an annual rate of 2 per cent until the year 2000, it has a market share of 60 per cent in Europe and 50 per cent in Japan, leaving ample room for further expansion[29].

35. Aluminium use in the automobile industry has also expanded, most rapidly in Japan, where the average aluminium content of cars was 101 kilograms in

1991[30]. Aluminium consumption by the Japanese car industry increased at an annual rate of 6.1 per cent from 1980 to 1992, compared to 3.7 percent for total aluminium consumption[31]. Driving this development is the need to reduce petrol consumption, both in order to conserve energy and to reduce airborne pollution from road traffic. Extensive use of aluminium is thus no longer confined to luxury or sports cars but is becoming more common also in lower priced models. It is worth noting, on the other hand, that the Japanese automobile manufacturer Mazda, which pioneered the use of aluminium sheet in car bodies, is reported to be considering going back to steel for cost reasons[32]. Nevertheless, the fact that aluminium is replacing other materials rather than being replaced by them implies that aluminium consumption will probably continue to grow at a rate higher than that of industrial production or GDP, assuming, of course, that the price of aluminium relative to other materials does not increase significantly.

36. Beyond the next couple of years, smelter operating costs are likely to increase since the limits of what can be achieved through rationalization have been reached in many cases, and since alumina prices are likely to rise in order to permit investment in new refining capacity. It is also uncertain whether power suppliers in the future will be willing to enter into the kind of variable price-linked power rate contracts that have been concluded over the past several years, given their recent experience of low prices and consequent loss of potential revenue[33]. Smelters using power from fossil fuel power plants are likely to have to contribute to the costs incurred as a result of more stringent regulations concerning air pollution, while new smelters requiring investment in new hydro power generating facilities are likely to be faced with higher costs resulting from increasing costs of construction. The rising costs, together with the experience of the present recession, may act as a disincentive to investment.

37. There does not appear to be a large risk, however, that investment would be insufficient to meet demand later during this decade. A large number of smelter projects are currently at the planning stage, while four new smelters are under construction - the Alusaf smelter in South Africa (planned capacity 460,000 tons per year, to be completed late 1995), the Bandar Abbas smelter in the Islamic Republic of Iran (220,0000 tons, 1996/97), the Aluyana smelter in Venezuela (215,000 tons, 1996/97) and the ALSCON smelter in Nigeria (180,000 tons, 1996/97). None of the other planned smelters is likely to be in operation before the end of 1997[34]. Assuming that expansions of existing smelters will add another 200,000 tons of capacity, potential production in 1997 would be about 17.4 million tons. If average annual growth in consumption from 1992 to 1997 is assumed to be 3 per cent, demand in the latter year would be 18 million tons. The Republics of the former USSR are likely to remain significant net exporters and would make up the apparent shortfall. Furthermore, production capacity in existing smelters can be increased relatively easily if needed, and the assumption concerning consumption may turn out to have been overly optimistic. Nevertheless, the example illustrates that it is important not to retire too much capacity permanently in the present recession and to undertake the investments that will allow smelters that at present are inefficient or polluting to improve their operations. If this is to be possible, however, the present gap betweeen supply and demand will have to be closed, making it possible for prices to return to levels that will permit investment.

38. A particular situation exists with regard to alumina. According to industry observers, many of the existing alumina refineries in the Republics of the former USSR will not be competitive once market based prices for their inputs are introduced[35]. Consequently, the need for alumina imports into these countries, which is already considerable, may increase. Taking into account the long lead time for construction of alumina refineries, the risk for a shortage of alumina in the second half of this decade must be considered to be higher than the risk for an aluminium shortage[36].

Notes

1. Unless otherwise indicated, data on consumption are from Metallgesellschaft: Metal Satistics. See also UNCTAD: Bauxite, alumina and aluminium statistics 1982-1992. Report by the UNCTAD secretariat (TD/B/CN.1/RM/BAUXITE/8).

2. While in theory these exports could be estimated on the basis of available trade data from importing countries, which cover most of 1993, this is not possible in practice since a very large proportion of exports from the republics of the former USSR are added to existing stocks in London Metal Exchange warehouses. The metal is not counted as imported until it leaves the warehouse for its final destination. Therefore, available trade data cover only a portion of exports from the countries concerned.

3. Production of semifabricates and foil in Japan declined by 3.4 per cent in April-September 1993 compared to the same period in 1992 (Japan Metal Bulletin, Tokyo, 1 September 1993)

4. Secondary aluminium production in the former USSR republics is reported to have fallen by about half in 1992 (Energy, Mines and Resources Canada: Canadian Minerals Yearbook 1992, Ottawa 1993). In the first six months of 1993, secondary production declined by a further 41 per cent compared to the same period in 1992 (Metals Week, New York, 9 August 1993).

5. Unless otherwise indicated, data on production are from World Bureau of Metal Statistics. See also UNCTAD: Bauxite, alumina and aluminium statistics 1982-1992 (TD/B/CN.1/RM/BAUXITE/8).

6. Bauxite production in the first nine months of 1993 was 3 per cent higher than during the corresponding period in 1992.

7. According to figures from the International Primary Aluminium Institute.

8. See UNCTAD: Market situation and outlook for bauxite, alumina and aluminium (TD/B/CN.1/BAUXITE/2), Geneva, 1993.

9. The figures for production and capacity are from the International Primary Aluminium Institute (IPAI). It is known that these figures, which are based on reports directly from the companies, often understate actual capacity and that therefore "real" capacity utilization may in fact be somewhat lower than is implied. Nevertheless, the IPAI data have been used here since they constitute the only consistent time series for capacity.

10. Metals Week, New York, 17 January 1994.

11. Aluminium industry analyst Anthony Bird, quoted in Metal Bulletin, London, 5 August 1993.

12. The Bonneville Power Administration has proposed to raise power rates for aluminium smelters by 14 per cent. Ten smelters with a combined capacity of 1.6 million tons per year in northwestern United States would be affected. In the longer term, it is uncertain whether variable rate contracts will be retained (Metals Week, New York, 16 August 1993). For smelters in other parts of the United States, which often rely on power from generating facilities using fossil fuels, more stringent air pollution regulations are expected to raise generating costs and consequently power tariffs.

13. Metals Week, New York, 8 February 1993.

14. Metals and Minerals Research Service: Metals Analysis and Outlook, third quarter 1993.

15. Metals Week, New York, 6 December 1993.

16. Quotas were distributed among individual European Community countries as follows: Germany 21,435 tons, Netherlands 20,869 tons, Italy 4,911 tons, Spain 1,316 tons, Belgium and Luxembourg 1,066 tons, United Kingdom 648 tons, Greece 454 tons and France 41 tons (Metal Bulletin, London, 23 August 1993).

17. Metal Bulletin, London, 13 September 1993.

18. Metal Bulletin, London, 6 January 1994.

19. See, for instance, letter from Wolf D. Breit, chief executive of Deeside Aluminium, in Metal Bulletin, London, 26 August 1993.

20. David Morton, chairman and chief executive officer of Alcan, commented: "It is of little use for one single national or regional government to impose quotas on CIS imports into their own territory. This merely diverts the problem. When you are filling a bath, it does not matter from which end you fill it. What matters is the level of the bathwater. In our case that is measured by the level of the LME inventories and hence the price of aluminium. Unless the problem is tackled on a concerted and negotiated basis, the current conditions are likely to persist and bring this industry to its knees." (Metal Bulletin, London, 21 October 1993)

21. Total of inventories of companies reporting to the International Primary Aluminium Institute (IPAI) and London Metal Exchange stocks. The actual increase is likely to have been somewhat higher since it is probable that unreported inventories increased as well.

22. See UNCTAD: Market situation and outlook for bauxite, alumina and aluminium (TD/B/CN.1/RM/BAUXITE/2), Geneva 1993.

23. Metal Bulletin Monthly, London, September 1993.

24. Metals Week, New York, 27 December 1993.

25. Metals Week, New York 17 January 1994.

26. Metal Bulletin, London, 17 July 1993.

27. The International Bauxite Association is quoted in Metal Bulletin Monthly, London, September 1993, as considering that the bauxite market has been showing a surplus of around 10 per cent recently.

28. American Metal Market, New York, 13 August 1993.

29. Metal Bulletin, London, 18 October 1993.

30. Mining Journal, London, 17 September 1993.

31. American Metal Market, New York, 9 September 1993.

32. Japan Metal Bulletin, Tokyo, 20 September 1993.

33. See note 12.

34. New smelter projects at the planning stage include several projects in Venezuela and in Chile, a joint venture between Jamaica and Trinidad and Tobago to be built in the latter country, and one project in each of Algeria, Iceland, Malaysia, Qatar and Saudi Arabia. In addition, expansions to several existing smelters are being studied.

35. Metal Bulletin, London, 16 September 1993.

36. In addition to the projects mentioned in table A.5 in the annex, several new alumina refineries are at the planning stage, including at least three in India and one in each of Greece, Indonesia and Jamaica.

ANNEX

Table A.1 Changes in bauxite mine production capacity 1992-1993

Country/operation	Owner	Change 1000 metric tons from end 1991	Effective date	Comment
Jamaica				
Alpart, Nain	Kaiser Hydro	**+500**	October 1992	Expansion
Suriname		**-1 000**		
Moengo	Alcoa	-2 000	End 1992	Shutdown due to exhaustion of reserves
Accaribo	Billiton Alcoa	+1 000	1992	New mine
Venezuela				
Los Pijiguaos	Government of Venezuela	**+2 000**	1993	Continuous expansion
Total		**+1 500**		

Source: UNCTAD secretariat, based on trade journals and information from industry

Table A.2 Changes in alumina refinery capacity 1992-1993

Country/operation	Owner	Change 1000 metric tons from end 1991	Effective date	Comment
Australia		**+780**		
Gove	Alusuisse Gove Alumina	+150	Early 1992	Expansion
Wagerup	Alcoa of Australia	+630	January 1993	Expansion
Brazil				
Alumar	Aluminio do Maranhao Alcoa Camargo Correa	**+200**	1992	Expansion
India				
Belgaum, Karnataka	Indalco	**+40**	February 1993	Expansion
Jamaica				
Alpart	Kaiser Hydro	**+250**	October 1992	Expansion
Venezuela				
Interalumina	Government of Venezuela	**+700**	1992	Expansion
Total		**+1 970**		

Source: UNCTAD secretariat, based on trade journals and information from industry

Table A.3 Changes in aluminium smelter capacity 1992-1993

Country/operation	Owner	Change 1000 metric tons from end 1991	Effective date	Comment
Australia				
Tomago	Pechiney Gove Aluminium Finance Australian Mutual Provident VAW Hunter Douglas	**+140**	November 1992	Expansion
Austria				
Ranshofen	Austria Metall	**-83**	End 1992	Shutdown
Bahrain				
Alba	Government of Bahrain Saudi Public Investment F. Breton Investments	**+235**	November 1992	Expansion
Canada		**+430**		
Alouette	Austria Metall Hoogovens Government of Québec VAW Kobe Steel Marubeni Corp.	+215	December 1992	New smelter
Deschambault	Alumax	+215	September 1992	New smelter
France				
Dunkerque	Pechiney Electricité de France Banque Nationale de Paris General Electric Norwich Union Suez Legal & General	**+215**	May 1992	New smelter
Germany				
Essen	Alusuisse	**-20**	Beginning 1992	Partial shutdown
India				
Belgaum, Karnataka	Indalco	**-73**	1992	Shutdown
Iran, Islamic Rep.				
Arak	Government of Iran	**+45**	1992/93	Expansion
Italy				
Fusina 2	Alumix	**-32**	May 1992	Shutdown
Total		**+857**		

Source: UNCTAD secretariat, based on trade journals and information from industry

Table A.4 Expected changes in bauxite mine production capacity 1994-1995

Country/operation	Owner	Change 1 000 metric tons from end 1993	Effective date	Comment
Brazil				
Trombetas	Mineraçao Rio do Norte Aluvale Alcan Alcoa Billiton CBA Hydro Reynolds	+1 500	1994	Expansion
India				
Panchpatmali	Government of India	+1 200	1995	Expansion
Jamaica				
Woodside	Government of Jamaica Alcoa	+500	1994	Expansion
Total		+3 200		

Source: UNCTAD secretariat, based on trade journals and information from industry

Table A.5 Expected changes in alumina refinery capacity 1994-1995

Country/operation	Owner	Change 1 000 metric tons from end 1993	Effective date	Comment
Australia				
Wagerup	Alcoa of Australia	**+200**	Mid-1994	Expansion
Brazil				
Alunorte	Government of Brazil Nippon Amazon Aluminium Company	**+1 100**	1995	New refinery
Jamaica		**+300**		
Clarendon	Government of Jamaica Alcoa	+200	1994	Expansion
Ewarton & Kirkvine	Alcan Government of Jamaica	+100	1994	Expansion
Republic of Korea				
Mokpo	General Chemical Corp.	**+215**	1995	New refinery, non-metallurgical alumina
Total		**+1 815**		

Source: UNCTAD secretariat, based on trade journals and information from industry

Table A.6 Expected changes in aluminium smelter capacity 1994-1995

Country/operation	Owner	Change 1 000 metric tons from end 1992	Effective date	Comment
Australia				
Gladstone	Comalco Austria Metall Sumitomo Mitsubishi Kobe Steel Yoshida Kogyo	+30	1994	Expansion
France				
Venthor	Pechiney	-31	1994	Shutdown
Norway				
Husnes	Hydro Alusuisse	+32	1994	Expansion
South Africa				
Richards Bay	Alusaf	+466	Late 1995	New smelter
Switzerland				
Steg	Alusuisse	-50	Autumn 1994	Shutdown
Total		+447		

Source: UNCTAD secretariat, based on trade journals and information from industry

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Standing Committee on Commodities
Third Ad Hoc Review Meeting on Bauxite
Geneva, 2 May 1994
Item 4 of the provisional agenda

REVIEW OF ACCURACY AND COMPLETENESS OF AVAILABLE STATISTICS ON BAUXITE, ALUMINA AND ALUMINIUM AND POSSIBLE MEASURES TO BE TAKEN THEREON

Review of the accuracy and completeness of statistics on bauxite, alumina and aluminium

Report by the UNCTAD secretariat

GE.94-50547 (E)

NOTE

The Second Ad Hoc Review Meeting on Bauxite held in April 1993 requested the UNCTAD secretariat to prepare a report to assist discussions under item 4 of the provisional agenda for the third session. In this context, several participants declared that they would provide the secretariat with suggestions in this regard, and that they would make efforts to communicate their ideas to the secretariat before 31 July 1993. A communication received from Canada is annexed to the present document. A first draft of the present report was sent by the secretariat in November 1993 to all the delegations that participated in the Second Ad Hoc Review Meeting. Comments were received from Australia and the OECD secretariat and were taken into account in the final version.

INTRODUCTION

1. In the non-ferrous metal industry, the need for more timely, complete and accurate information is increasingly recognized. A greater transparency of the market plays a major role in the process of decision-making, at the industry as well as at the Government level.

2. Although statistical problems vary with the structure of each metal industry, the whole non-ferrous metals sector currently experiences increasing difficulties in producing or obtaining the information needed. Changes in the overall economic and political situation of the world are generally considered as responsible for the deterioration of the availability of comprehensive and reliable statistics, in particular:

(i) Constraints on public expenditure, deregulation, privatization, and the general move toward "less government" have in many instances reduced the effectiveness of governmental statistical collecting and releasing agencies.

(ii) Severely affected by the 1980s recession, the mining and metal producing industries reduced or at least delayed their participation in routine statistical enquiries: the timeliness and quality of responses consequently deteriorated.

(iii) With more severe international competition, producing companies have become more concerned about commercial secrecy, asking for the suppression of details of their activity. The existence of only few companies in a country resulted sometimes in the absence of detailed information for the whole country.

(iv) The fact that significant volumes of production and consumption take place in a wider range of countries has complicated the problems of collecting and analysing data.

(v) Last but not least, as stated by Metallgesellschaft in the introduction to its 1991 edition of Metal Statistics : "the opening up of Eastern Bloc is resulting in an abundance of partially contradictory information on their non-ferrous metal industries. Part of the problem is due to the fact that the 'statistical language' is different to that spoken in the West. It is to be hoped that with the introduction of a market economy, the necessity for a uniform "language" is recognized and alignment is made with the standards of Western statistics. Until then, for most countries we will have to rely, now as before, on analysis of Western trade statistics in order to estimate trends in consumption".

3. The world bauxite/alumina/aluminium industry does not escape these statistical problems. In this report, an attempt has been made to analyse in detail the specific problems affecting the industry and to make suggestions for dealing with them.

I. DEFINITIONS

4. Before entering into consumption, aluminium is mined as bauxite, transformed into an intermediate product (alumina) and converted into metal. A summary of definitions and units commonly used is given below:

A. Bauxite

5. The most common source of primary aluminium is bauxite, the use of other aluminium-bearing materials such as alunite and nepheline syenite being still marginal and confined to the former USSR countries. Production of alumina does not, however, constitute the only outlet for bauxite, although it accounts for the major part (about 90%) of bauxite consumption. About one tenth of bauxite mined is directly used in the production of refractories, abrasives and cements and in the chemical industry.

6. Quantities of bauxite are usually expressed in terms of actual wet or dry weight, unlike ores of other non-ferrous metals for which the average metal content (recoverable or by analysis) is given.

B. Alumina

7. Transformation of bauxite produces alumina in the form of an hydroxide. About 90 per cent of the alumina production is used to produce aluminium, while the rest is used directly in refractories, cement, chemical and other minor industries. Depending on the specific quality of the bauxite used, a varying amount of the aluminium present in the ore stays as silicate and cannot be recovered. As in the case of bauxite, quantities of alumina are almost always expressed in terms of actual weight.

C. Aluminium

8. Production of aluminium may originate from two sources: primary, by electrolysis of calcined alumina, and secondary, recovered from scrap.

(i) Primary aluminium is usually defined as produced from alumina in pigs, ingots, billets, cakes and wire bar;

(ii) Secondary aluminium is usually defined as produced by smelting of old scrap (discarded products and wastes) and new scrap (scrap deriving from manufacturing operations, rejects and residues).

9. Corresponding distinctions do not exist in trade statistics for aluminium, where primary and secondary are combined under the heading "aluminium unwrought".

10. Most of the time, published consumption figures for aluminium relate to the "apparent consumption" calculated by the availability method, i.e. production plus imports minus exports with adjustments for known changes in stocks. Except for some countries which collect separate data for primary and secondary materials, consumption figures refer to total consumption of aluminium, to which direct use of scrap (that is the scrap that has not been remelted) can be added, when available .

D. Trade nomenclatures

11. Trade data are collected by the Customs administrations, according to the specific definitions of their own Trade Nomenclatures. Currently, a large number of countries implement the nomenclature of the *Harmonized Commodity Description and Coding System*. There is a close correlation between this system and the *Standard International Trade Classification* (SITC) of the United Nations. The table below gives the concordance between the five statistical international trade codes currently in use: the *Standard International Trade Classification* (SITC Rev.1, Rev.2 and Rev.3); the *Customs Co-operation Council Nomenclature* (CCCN); and the *Harmonized Commodity Description and Coding System* (HS).

II. SOURCES

12. Statistical data on aluminium industry are generated, collected and disclosed at various levels, governmental or private, national or international.

A. International sources

1. UNCTAD

13. The UNCTAD Commodity Yearbook provides disaggregated data at the world, regional and country levels for production, trade and consumption of selected primary commodities. It includes detailed data on bauxite, alumina and aluminium. Production and consumption figures are compiled from *Metal Statistics* published by Metallgesellschaft AG. Most of the trade figures, expressed in terms of quantity and value, are officially published or supplied to the United Nations Statistical Office by governments. The rest are estimated by the UNCTAD secretariat with a view to arriving at regional and world aggregates which are as complete as possible.

2. International Bauxite Association (IBA)

14. The membership of the International Bauxite Association (IBA) consists of eight bauxite producing developing countries, namely: Ghana, Guinea, Guyana, Indonesia, Jamaica, Sierra Leone, Suriname and the former Yugoslavia. It publishes a quarterly review with general papers and information on specific aluminium industry developments, but does not systematically release detailed information on bauxite production, trade and consumption at the country or the world level.

3. International Consultative Group on Non-Ferrous Metal Statistics

15. The International Consultative Group on Non-Ferrous Metal Statistics is an informal group of representatives of industry organizations, major companies, government statistical agencies and intergovernmental organizations involved in the preparation of data for the major non-ferrous metals, including bauxite, alumina and aluminium.

Concordance between statistical international trade code

	SITC Rev.1	SITC Rev.2	SITC Rev.3	CCCN	HS
Aluminium ores & concentrates:	283.3	287.31	285.1	ex 26.01	2606.00
Aluminium oxide:	ex 513.65	287.32	285.2	ex 28.20	2818.20
Aluminium hydroxide:	ex 513.65	522.56	522.66	ex 28.20	2818.30
Aluminium waste and scrap:	284.04	288.23	288.23	ex 76.01	7602.00
Aluminium & aluminium alloys, unwrought:	684.1	684.1	684.1	ex 76.01	76.01
- aluminium, not alloyed:			684.11		7601.10
- aluminium alloys:			684.12		7601.20
Aluminium & aluminium alloys, worked:	684.2	684.2	684.2		
- bars, rods, angles, shapes and sections aluminium wire:	684.21	684.21		76.02	
- bars, rods & profiles:	ex 684.21 ex 684.25	ex 684.21 ex 684.25	684.21	ex 76.02	76.04
- wire:	ex 684.21	ex 684.21	684.22	ex 76.02	76.05
- plates, sheets & strip:	684.22	684.22			
- plates, sheets & strips of a thickness exceeding 0.20 mm			684.23	76.03	76.06
- foil (whether or not embossed, cut to shape, perforated, coated, printed or backed with paper or other reinforcing material) of a thickness (excluding any backing) not exceeding 0.20 mm:	684.23	684.23	684.24	76.04	76.07
- powder & flakes:	684.24	684.24	684.25	76.05	76.03
- tubes, pipes & blanks therefor; hollow bars:	684.25	684.25		76.06	
- tubes & pipes:	ex 684.25	ex 684.25	684.26		76.08
- tube & pipe fittings (e.g. joints, elbows, socket & flanges):	684.26	684.26	684.27	76.07	7609.00

Source: Department of International Economic and Social Affairs - Statistical Office - Statistical papers, Series M - United Nations - New York.

16. The members of this Group are: Aluminium Pechiney; American Bureau of Metal Statistics; Billiton International Metals BV; British Geological Survey; Department of Energy, Mines and Resources, Canada; Falconbridge Ltd; Inco Europe Ltd; International Lead and Zinc Study Group; International Wrought Copper Council; Le Nickel SLN; Metaleurop S.A.; Metallgesellschaft AG; Nuova Samim SpA; Outokumpu Mining Oy; United States Bureau of Mines; and World Bureau of Metal Statistics.

17. The Group meets annually in mid-year to review available data on production and consumption of the principal non-ferrous metals for the previous year and to discuss problems encountered in maintaining accurate and consistent coverage for individual countries. Between meetings, members remain in contact by reporting new or revised information received. The Group's actions have resulted in a much greater degree of consistency between the various sets of world data issued by member companies and organisations and published monthly or annually.

4. International Primary Aluminium Institute (IPAI)

18. The International Primary Aluminium Institute (IPAI) is an international association of companies engaged in the production of primary aluminium. The objectives of the Institute include the promotion of understanding of the world's aluminium industry including, inter alia, the collection and publication of statistical information relating to the international industry. IPAI has developed a statistical system geared to produce reliable and significant statistics. It includes all alumina and primary aluminium facilities throughout the world, with the exception of the former socialist countries of Europe (Hungary is now included), the socialist countries of Asia and former Yugoslavia. This system, based upon returns submitted by the primary aluminium and alumina producers themselves, is confidential in that the figures provided by individual companies are never disclosed in any circumstances. The companies' figures are aggregated by IPAI into Geographical Areas, so that the identity of individual producers is lost in the total. If in respect of any series there are insufficient producers in any one Geographical Area to ensure that individual figures are unidentifiable, the totals for that Area are combined with those of another Area.

19. IPAI issues seven statistical series using extremely precise definitions which ensure that published statistics are as far as practicable collected on the same basis and consistent, and give a uniform picture of the industry's activity:

- Primary aluminium production (monthly).
- Primary aluminium annual production capacity (six-monthly).
- Physical movement of primary aluminium between Geographical Areas 1-7 (IPAI producers) and Area 8 (former socialist countries of Europe and socialist countries of Asia).
- Inventories of unwrought aluminium including secondary metal (monthly).
- Aluminium recovered from purchased or tolled scrap (annually).
- Alumina production (quarterly).
- Alumina annual production capacity (six-monthly).

B. National sources

1. Official

20. Mine, Industry or Customs Departments of producing and consuming countries collect a certain amount of data from their own aluminium industry. The coverage and the definitions of the data as well as the coverage and the actual availability of the information released in regular official publications may vary considerably from one country to another.

21. Official services of some countries publish yearbooks on world mineral and metal statistics, including production and trade figures for bauxite, alumina and aluminium. "***Minerals Yearbook***" of the US Bureau of Mines, and "***World Mineral statistics***" of the British Geological Survey are the best known in this regard.

2. Private

22. The regional or national aluminium associations (e.g., Aluminium Association of the USA, European Aluminium Association, Japan Aluminium Federation) publish data on primary aluminium (production, external trade, consumption by end-uses) together with data on semi-manufactured products. Regular statistics on the world aluminium industry can be found also in publications issued by companies or private organisations. Among these, the most commonly used are:

- "***World Metal Statistics***", published monthly by the World Bureau of Metal Statistics, United Kingdom;

- "***Metal statistics***", published annually by Metallgesellschaft AG., Germany;

- "***Non Ferrous Metals***", published annually by Nuova Samim, Italy;

- "***Annuaire statistique Minemet***", published annually by Metaleurop S.A., France;

- "***Non-Ferrous Metal data***", published annually by the American Bureau of Metal Statistics, USA.

Each of these publications present a different set of data, but they can be assumed to be generally consistent and comparable, since their editing bodies are all members of the International Consultative Group on Non-Ferrous Metal Statistics.

23. Specific statistical data on aluminium industry in various countries are occasionally published in trade journals such as "***Mining Journal***" (weekly), "***Mining Magazine***" (monthly & annual), "***Metals Weeks***" (weekly), "***Metal Bulletin***" (twice weekly), "***Metal Bulletin Monthly***", "***World Mining***" (monthly), "***Mining Engineering***" (monthly), and "***American Metal Market***" (daily).

III. ANALYSIS OF AVAILABLE STATISTICS

24. A review of the accuracy and completeness of statistical data commonly available on bauxite, alumina and aluminium presents two different aspects. On

the one hand, the survey of completeness, frequency and availability of data is a relatively easy factual exercise. On the other hand, the analysis of the accuracy of data requires very high and specific competence on the bauxite/alumina/aluminium industry.

25. Section A below summarizes the findings of the UNCTAD secretariat, while section 4.2 presents the opinions commonly expressed by the representatives of government agencies or private companies.

A. Availability, frequency, completeness

26. Depending on the type of information needed and on the publication concerned, the availability of statistical data on bauxite, alumina and aluminium presents a high degree of variability.

1. Availability

27. The practical availability of statistical data can be assessed with regard to the extent to which satisfactory answers may be given to the following three questions:

- Are the data that are needed actually collected ?
- Are the data which are collected disclosed in regular publications ?
- Are these publications easy to acquire or to consult ?

28. The first question cannot be answered without knowing the detailed items of the statistical questionnaires sent to companies by the official services of producing or consuming countries. However, it can be assumed that the set of data requested and the ratio of the responses received may vary according to the importance of the aluminium industry in the country concerned.

29. Regarding the second point, it is obvious that various items of information, some of them of major importance, are collected but not published by the official bodies concerned, for technical reasons or in order to protect the commercial secrecy of reporting companies. For instance, the "***Quarterly mineral statistics***" issued regularly by the Australian Bureau of Agricultural and Resource Economics does not show the quantities of bauxite exported and the destination of alumina exports (which include aluminium hydroxide), and does not mention stocks. Aluminium producing countries of the former USSR are also particularly concerned by this point.

30. The third question raises the problem which could be the most easily solved. Indeed, the real value of an information, as important as it could be, lies in the fact that it is widely and timely disseminated among actual or potential users. The situation experienced by the United Nations and GATT libraries in Geneva shows that it is almost impossible to build and maintain a complete and up-to-date set of official national publications dealing with the minerals and metals industry: for most of the bauxite/alumina/aluminium producing or consuming countries, such publications do exist, but, especially in the case of developing or Eastern European countries, they are issued with increasing delays and sent very irregularly to users (when they are sent at all).

31. In terms of availability, it is clear that, in the present circumstances, private sources largely compensate their "unofficial" status and their inevitably restricted picture of the bauxite/alumina/aluminium industry (as most of them are not exclusively devoted to these commodities), by the fact that they are regularly up-dated and made quickly available at any place. Such sources represent a very useful supplement to the official, but sometimes unavailable, publications.

2. Frequency

32. The above observations are applicable to the problem of the frequency of information released: depending on the reporting country, it can be monthly, quarterly or annual. Global figures on production and trade are more usually disclosed on a monthly basis than other types of data. In the case of data published by private organisations, monthly figures are most of the time estimated on the basis of some previous period.

3. Completeness

33. The completeness of the data supplied is highly dependant on the reporting sources. On a national basis, some public agencies disseminate very detailed data, in particular:

- In its ***"Mineral industry surveys"***, the United States Bureau of Mines publishes, on a monthly basis, all the components of aluminium supply in the United States (production, trade and stocks), with special tables on scrap consumption and metallic recovery, including estimates for quantities not reported. On the other hand, as the structure of the industry precludes the disclosure of production data in a non-aggregate form, the part of this publication devoted to bauxite and alumina is issued quarterly and presents only imports and exports, by destinations and grades. More detailed data on the United States bauxite/alumina consumption, stocks and external trade are available in the ***"Minerals Yearbook"***.

- ***"Anuario Mineral Brasileiro"***, issued by the Department of Mines and Energy of Brazil, provides a very complete information on the Brazilian bauxite industry, from reserves by state and economic status to producer stocks, total trade (including all aluminium products), labour employed and investments. Unfortunately, the distribution of this publication now seems to be much more restricted than in the past.

Such publications have no equivalents in most of the other producing or consuming countries.

34. The following presents a summary picture of the present situation:

(i) Official data on production and trade of bauxite, alumina and aluminium are published by most producing and consuming countries, with a time-lag varying between two to twelve months or even more.

(ii) Stocks and reported consumption figures are very rarely supplied by any primary source.

(iii) The distinction between bauxite/alumina produced for aluminium-making purposes and bauxite/alumina for other uses, as well as the distinction between primary and secondary aluminium or old and new scrap imported, exported or consumed are not commonly made in existing publications.

(iv) As experienced by the UNCTAD secretariat in the collection of tin statistics, countries of the former USSR have started to release data on their mineral and metal activities through newly created statistical committees. Bauxite, alumina and aluminium statistics are likely to benefit from this development in the near future.

(v) China, which for decades did not supply any data on its aluminium industry, is now publishing its total trade ("aluminium ore, alumina oxide, aluminium and its alloys unwrought, and aluminium products") on a monthly basis, and its trade by origin and destinations on an annual basis. Production and consumption figures are still not available.

(vi) The regional grouping of the data collected from companies by the IPAI, as well as the exclusion of some major countries from the totals published, lessen significantly the geographical completeness of the data released. As inventory statistics refer only to inventories reported by IPAI producers, their geographical coverage is also incomplete.

(vii) Publications issued by members of the International Consultative Group on Non-Ferrous Metal Statistics present the most comprehensive set of statistics: world production and consumption tables are published on a country-by-country basis and the figures are comparable, even if not exactly identical; for some important producers or consumers, country tables provide data on trade by product and by origin and destination, on production of aluminium semi-manufactures and sometimes on consumption by end-uses.

B. Accuracy

35. In spite of the great number of available statistical publications on the aluminium industry, which are generally considered to be of a good quality, various problems persist, which are presented below.

1. Bauxite/alumina

36. Statistics on bauxite and alumina production are difficult to compile. Owing to a lack of agreed standards and definitions, published data are a mixture of shipments or production as well as of dry and wet weight for bauxite. For alumina, data refer to calcined alumina, alumina hydrate or Al_2O_3 equivalent of hydrate. For both bauxite and alumina, the quasi-general absence of data on the metallic and non-metallic uses and on the average recoverable aluminium content

of production and trade at the country level does not make it possible to produce supply/demand balances which could be usefully linked with supply/demand balances relating to primary aluminium.

2. Primary aluminium production

37. There are increasing difficulties in distinguishing between primary and secondary metal, as a result of technical change occurring in the primary production process.

3. Primary aluminium consumption

38. As a rule, the lack of data on inventories and external trade covering primary aluminium only (instead of all unwrought aluminium) makes estimates difficult for countries which are becoming significant consumers of primary aluminium. As a result, the figure for total consumption obtained by adding country by country substantially differs from the global estimate derived from available Western world data.

4. Secondary production and scrap

39. Data on this part of the aluminium industry are notoriously unsatisfactory; the problem arises both from the definition of scrap and the way scrap is collected. Recently, *Metallgesellschaft* (***Metal Statistics 1988***) stressed the "increasing difficulties of a timely presentation of important statistical data, to be used as a basis for reliable forecasts. One reason is the increasing use of old and new scrap in the supply for so-called "primary refineries" as is to be found recently, for example, in many aluminium primary smelters. Double counting caused by the direct use of scrap in the first processing stage is on the agenda in many countries, for example in the recycling of scrap from cans". Statistics are indeed available, but quality is extremely variable, definitions are not harmonized and the geographical coverage is not sufficient. Owing to the increasing role of this resource, the aluminium industry hopes to improve the quality of the data related to secondary recovery.

5. Consumption by end-uses

40. Data are only available for a limited number of countries. In addition, nomenclature differs from one country to another. "Important industrial countries such as USA and United Kingdom rely on voluntary reports from industry only. Statistics dealing with end-uses derived in this way are of very limited value as, for example, for zinc, aluminium and nickel in the USA. For Japan we have decided, in agreement with the other relevant statistical institutions, to calculate the consumption of refined copper and primary aluminium in line with our own knowledge and methods, thus deviating from the official sources..." (*Metallgesellschaft* - ***Metal Statistics 1988***).

6. Stocks

41. Stock figures from exchanges (LME, COMEX) are accurate and easily available. Figures on producer stocks of the Western world made available by IPAI are considered acceptable but their coverage is incomplete. Consumer and merchant stocks data are non-existent for almost all the consuming countries. In its

comments (see annex), the Canadian delegation points out that an eventual identification of the countries of origin and destination in the publication of the LME inventories would substantially contribute to the transparency of the market: the present situation, where the final destination of metal is not known, leads to overestimating of the trade flows towards the countries where the warehouses are located.

7. Trade

42. On the whole, data on external trade are good, within the limits of the definitions: bauxite and alumina for metallic and non-metallic uses, primary and secondary aluminum are aggregated in any international trade nomenclatures, where furthermore the specific units used (e.g dry or wet weight for bauxite, Al_2O_3 equivalent for alumina) are not defined; trade data of some countries still aggregate unalloyed and alloyed unwrought aluminium.

43. On the other hand, Customs reports do not generally identify the country of first origin or of last destination and may lead to some double-counting. Lastly, there is often some discrepancy between external trade figures published by the Customs departments, collected from the customs declarations in terms of quantity and f.o.b. or c.i.f. value, and those supplied by the companies, representing most of the time the foreign shipments from their plants: the period of recording, for the same physical quantities, may noticeably vary.

44. The suppression of data on grounds of confidentiality sometimes adds to these "structural" inadequacies of the nomenclature. Attempts to recover the withheld information by using partners' trade reports are in that case very hazardous, for the above reasons. The consequence of such gaps in the trade flows is also that it is virtually impossible to reasonably estimate the consumption of many of the smaller countries without domestic producing industries.

8. Total consumption

45. For all the above reasons, official figures for reported consumption in most countries, when available, differ substantially from the apparent consumption data commonly used in international compilations.

9. Countries of Eastern Europe

46. Except for Hungary or Poland, which continued to release figures on production and external trade on bauxite, alumina and aluminium during the last 15 years, the present state of the statistical information in the former socialist countries of Eastern Europe is very poor, although one of them is one of the major world aluminium producing and exporting countries. The data which have been newly published are not currently provided in a systematic form and, at times, are partial and contradictory. As noted in the 1993 edition of ***Metals & Minerals Annual Review***, "more information was made publicly available on the CIS aluminium industry during the year, particularly as a result of a conference organised by the producers' association Concern Aluminiy, in September. ... Figures were also released on trade ..., but problems of definition and coverage mean that the position remains somewhat confuse".

IV. CONCLUSIONS

47. Improving the transparency of the international bauxite/alumina/aluminium market depends on the ability to improve the quality and availability of published international statistics on bauxite/alumina and aluminium. Production, trade, stocks and consumption are likely to be the key statistical items in the first step of such an exercise.

48. An examination of the coverage of existing national and international statistical data sets suggests that useful action could be taken first on the following points:

(i) Harmonization of the specific definitions and units of measurement of the various products;

(ii) Harmonization of the definition of the various stages of production and consumption;

(iii) Distinction between primary and secondary aluminium in the trade data;

(iv) Systematic collection of data on stocks held by merchants and consumers;

(v) Review of existing country statistical reporting systems to take account of technological and other changes;

(vi) Special attention to ensure the timely publication, in whatever appropriate form, and the widest dissemination, by whatever appropriate means, of available statistical information from all countries, including countries which at present do not publish complete statistics on bauxite, alumina and aluminium.

Annex

COMMUNICATION RECEIVED FROM CANADA

COMMENTS FROM CANADIAN PARTICIPANTS

Production

Canadian data on primary aluminium production are consistent with IPAI data; that is to say, they measure the metal taken from the electrolytic vats. Because of this, the data cannot be distorted through the possibility of metal re-entering the production chain (comment made in OECD document CE/CG(89)10, p. 4). The data collection system in operation works well and the Canadian industry considers the published data to be very reliable.

As far as secondary aluminium production is concerned, Statistiques Canada does not publish a report on this subject, although some partial data are in fact compiled on the occasion of the annual survey of aluminium consumption. This question could be studied, if need be, as part of a more thorough examination of our data collection procedures.

Consumption

Canadian data on aluminium consumption are collected through an annual survey. Although the rate of reply to these surveys is improving regularly, the respondents do not yet represent the entire industry. Furthermore, Canadian consumption data are established in terms of the type of processing of the metal (such as casting, forging, extrusion, lamination, powder, deoxidation, secondary production, etc. ...) and not by type of industry or end use (such as automobile, construction, packaging, etc. ...).

Although they consider the quality of the data to be acceptable, Canadian aluminium producers feel that American and Japanese consumption data are generally more complete and believe that Canadian data (and those of several other countries) should possibly be comparable to them. This question, too, might be more thoroughly examined in a broader context. IPAI does not publish anything on consumption, whereas WBMS produces a world compilation that is acceptable in most cases.

Stocks/inventories

Canadian data on stocks are partial and do not take into account all the following types of inventories: from producers, consumers and merchants. Data are compiled through an annual survey of respondents identified as producers of pure aluminium or aluminium alloys. Although the inventories of primary aluminium producers are not published, this does not mean they have been omitted. Apparently no data are compiled with respect to merchants and other intermediaries.

Although data collection procedures could be improved, account should be taken of the cost-benefit ratio given the relatively modest size of the Canadian domestic market and, therefore, of the statistical value of some of these data

(merchantable stocks, for example). As for the IPAI data, they are fairly reliable and have the advantage of continuity in time. However, regional groupings are outmoded and prevent close analysis of the markets.

Trade data

Canadian trade data are published monthly by Statistiques Canada with no omissions whatsoever. Since 1987 Canada has been using the Harmonized Commodity Description and Coding System and publishes the data in the following forms: imports, domestic exports, total exports (i.e. including re-exports). Unlike Japan, for example, Canadian data on international trade make no distinction between primary and secondary aluminium.

Under an agreement between Canada and the United States, the two countries' trade data are exchanged in such a way that one uses the other's imports to evaluate its own exports. Canadian trade data are directly accessible via the TIERS electronic data bank designed by Statistiques Canada.

Canadian industry believes that Canadian trade data are generally quite reliable. However, owing to the growth of exports to LME warehouses, mainly those of Rotterdam, the volume of exports to the Netherlands is overestimated. This situation is detrimental to market transparency, for little is known about the final destinations of the metal. It has therefore been wondered in some quarters whether LME might possibly publish its inventories with an identification of the countries of origin and destination.

The question remains in abeyance as regards European data, which are being affected by the establishment of the single market. The commitments made by the European authorities imply that market transparency will not be lessened by this change.

Data continue to be omitted deliberately in certain countries, especially as regards bauxite and alumina. Delays in publication of data by other aluminium-producing countries also have effects similar to those deriving from the omission of data.

Primary-secondary distinction

By and large, Canadian data are much more complete as regards primary aluminium. This situation is basically due to historical reasons and to the fact that Canada is a major producer of primary aluminium. However, growth in the production and consumption of secondary aluminium might possibly lead to this question being studied in Canada, especially if industry were to express a need for it.

From a more general point of view, world data on the production and consumption of secondary aluminium are fairly approximate, despite its growing (and at times leading) importance. Furthermore, complete data on international trade in secondary metal are non-existent. This is an extremely complex question that can only be resolved in a multilateral framework.

Energy, Mines and Resources Canada / Énergie, Mines et Ressources Canada

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ANNUAL SURVEY – ENQUÊTE ANNUELLE

CONSUMPTION OF ALUMINUM METAL
CONSOMMATION D'ALUMINIUM MÉTAL
1992

IMPORTANT

Kindly complete and return this form within 30 days of receipt. Collected under the authority of the federal *Resources and Technical Surveys Act* CR-7, R.S.C. 1970.

Retourner ce questionnaire dûment rempli dans les 30 jours. Déclaration exigée en vertu de la *Loi sur les ressources et les relevés techniques* CR-7, R.S.C. 1970.

100.1 Name of person responsible for this report – Nom de la personne responsable de ce rapport

100.2 Telephone (area code and number) Téléphone (indicatif régional numéro)

100.3 Facsimile – Télécopieur

Please correct any mistakes in Name or Address – Prière de corriger le nom ou l'adresse, s'il y a lieu

TABLE "A". Receipts and inventories of aluminum metal. TABLEAU «A». Arrivages et stocks d'aluminium métal.	Primary aluminum ingot and alloys – Lingots et alliages de première fusion	Purchased secondary ingot – Lingots de deuxième fusion achetés	Outside scrap – Rebuts provenant de l'extérie
	Kilograms – kilogrammes (1)		
Opening inventory (+) Stocks d'ouverture (+)			
2.1 Plant Receipts (+) Arrivages à l'usine (+)			
3.1 Aluminum Metal Shipments (–) Expéditions d'aluminium métal (–)			
4.1 Total Consumption of Metal (line 6.1 + line 11.1) (–) Consommation totale de métal (ligne 6.1 + ligne 11.1) (–)			
5.1 Closing inventory Stocks de fermeture			

TABLE "B". Consumption of aluminum metal. TABLEAU «B». Consommation d'aluminium métal.	Primary aluminum ingot and alloys – Lingots et alliages de première fusion	Purchased secondary ingot – Lingots de deuxième fusion achetés	Outside scrap – Rebuts provenant de l'extérie
Aluminum metal used during year for, or in the production of – Aluminium métal utilisé pendant l'année pour les produits suivants ou dans leur fabrication :	Kilograms – kilogrammes (1)		
6.1 Secondary ingot – Lingots de deuxième fusion		XXX	
7. Castings – Moulages :			
7.1 Die – Sous pression			
7.2 Permanent mould – En coquilles			
7.3 Sand – En sable			
7.4 Other (including cast busbar) – Autres (y compris les barres omnibus moulées)			
8. Wrought products – Produits ouvrés :			
8.1 Extrusions (including pipe) – Par extrusion (y compris les tuyaux)			
8.2 Forgings and impact slugs – Pièces forgées et piècettes			
8.3 Sheet, plate, coil or foil – Feuilles, plaques, bobines ou lames			
8.4 Wire rod and other rolled shapes – Tiges et autres laminés			
9.1 Destructive uses (deoxidizer) – Usages destructifs (désoxydants)			
10. Other uses – Autres usages :			
10.1 Non aluminum base alloys – Alliages à base autre que d'aluminium			

10.2 Powders and paste – Poudres et pâtes			
10.3 Other uses (specify) – Autres usages (préciser)			
11.1 TOTAL USED (excluding secondary line 6.1). TOTAL UTILISÉ (sauf deuxième fusion, ligne 6.1).			

1) SI conversion factor: 1 lb. = 0.453 592 37 kg. – Facteur de conversion au système international : 1 livre = 0,453 592 37 kilogramme.

ENQUÊTE SUR LA CONSOMMATION D'ALUMINIUM MÉTAL: DIRECTIVES À L'INTENTION DES RÉPONDANTS

L'ALUMINIUM MÉTAL DÉSIGNE LES LINGOTS ET LES ALLIAGES D'ALUMINIUM DE PREMIÈRE FUSION, LES LINGOTS D'ALUMINIUM DE SECONDE FUSION ET LES REBUTS DE L'EXTÉRIEUR.

Les lingots et les alliages d'aluminium de première fusion désignent les lingots refondus (consommés à des fins de refonte), les lingots obtenus par extrusion (consommés pour produire des tiges, des tubes et des billettes), les lingots de laminage (consommés pour la production de brames), les barres à fil et le métal fondu (première fusion).

Les lingots de seconde fusion désignent les lingots de seconde fusion et le métal fondu de seconde fusion achetés.

Les rebuts de l'extérieur désignent les rebuts d'aluminium achetés à l'état "nouveau" ou "ancien". Les rebuts produits à l'installation et consommés par la génératrice ne sont pas inclus. Veuillez prendre note que les lingots d'alliages de refonte ne comportant pas de spécifications sont classifiés comme des rebuts.

TABLEAU A: ARRIVAGES ET STOCKS D'ALUMINIUM MÉTAL

Indiquer, à la colonne pertinente de chaque ligne, la consommation d'aluminium métal.

Ligne 1. Stocks d'ouverture
Déclarer les stocks d'aluminium métal au début de l'année. Ne pas indiquer les stocks de produits semi-ouvrés ou ouvrés.

Ligne 2. Arrivages à l'usine
Déclarer les achats d'aluminium métal faits par votre société au cours de la période visée par le rapport.

Ligne 3. Expéditions
Déclarer la quantité d'aluminium métal expédiée sans frais au cours de la période visée par le rapport. Ne pas déclarer les stocks de produits semi-ouvrés ou ouvrés.

Ligne 4. Consommation totale
Déclarer la consommation d'aluminium métal. À chaque colonne, les données inscrites à la ligne 4 doivent correspondre au total des données des lignes 6 et 11.

Ligne 5. Stocks de fermeture
Déclarer les stocks d'aluminium métal à la fin de la période visée par le rapport. Ne pas déclarer les stocks de produits semi-ouvrés et ouvrés.

TABLEAU B: CONSOMMATION D'ALUMINIUM MÉTAL

Ligne 6. Lingots de seconde fusion
Déclarer la consommation d'aluminium métal à des fins de production de lingots de seconde fusion destinés soit à la vente ou à des utilisations internes.

Lignes 7.1, 7.2, 7.3 et 7.4. Moulages
Déclarer la consommation d'aluminium métal à des fins de production de moulages.

Lignes 8.1, 8.2, 8.3 et 8.4. Produits ouvrés
Déclarer la consommation d'aluminium métal à des fins de production de produits ouvrés.

Ligne 9. Usages destructifs
Déclarer la consommation d'aluminium métal pour des usages destructifs comme la déoxydation de l'acier, la fabrication de torches et d'explosifs, etc.

Lignes 10,1, 10.2 et 10.3. Autres usages
Déclarer la consommation d'aluminium métal pour d'autres usages.

Ligne 11. Consommation d'aluminium métal
Les données de la ligne 11 doivent correspondre au total de celles des lignes 7.1 à 10.3 inclusivement. Ne pas inclure la ligne 6 dans le total de la ligne 11.

ALUMINUM METAL SURVEY: INSTRUCTIONS TO RESPONDENTS

ALUMINIUM METAL REFERS TO PRIMARY ALUMINUM INGOT AND ALLOYS, SECONDARY ALUMINUM INGOT AND OUTSIDE ALUMINUM SCRAP

Primary aluminum ingot and alloy refers to remelt ingot (consumed for remelt purposes), extrusion ingot, (consumed to produce rods, tubes and billets), sheet ingot, (consumed to produce slabs), wire bar and molten metal in primary form.

Secondary ingot refers to purchased secondary ingot and molten metal in secondary form.

Outside scrap refers to "new" and "old" purchased aluminum scrap. Internally generated scrap consumed by the generator is not included. Note than non-specification remelt alloy ingot is classified as scrap.

TABLE A: RECEIPTS AND INVENTORY OF ALUMINUM METAL

For each line, report the quantity of aluminum metal consumed in the appropriate column.

Line 1. Opening Inventory
Report aluminum metal on hand at the beginning of the year. Do not report inventories of semi-fabricated or finished products.

Line 2. Plant receipts
Report aluminum metal purchased by your company during the reporting period.

Line 3. Shipments
Report the quantity of aluminum metal shipped without change during the reporting period. Do not report inventories of semi-fabricated or finished products.

Line 4. Total Consumption
Report aluminum metal consumed. For each column, the entry in line 4 should equal the entry in line 6 plus the entry in line 11.

Line 5. Closing Inventory
Report aluminum metal on hand at the end of the reporting period. Do not report inventories of semi- fabricated or finished products.

TABLE B: CONSUMPTION OF ALUMINUM METAL

Line 6. Secondary ingot
Report aluminum metal consumed to produce secondary ingot which is intended either for sale, or for internal use.

Line 7.1, 7.2, 7.3, and 7.4. Castings
Report aluminum metal consumed to produce castings.

Line 8.1, 8.2, 8.3, and 8.4. Wrought products
Report aluminum metal consumed to produce wrought products.

Line 9. Destructive uses
Report aluminum metal consumed in destructive uses such as steel de-oxidation, flares and explosives etc.

Line 10.1, 10.2 and 10.3. Other uses
Report aluminum metal consumed in other uses.

Line 11. Consumption of aluminum metal
The entries in line 11 should equal the total of entries in lines 7.1 through 10.3 inclusive. Do not include line 6 in the line 11 total.